

Amendments to the Claims

Please amend Claims 13, 14 and 21. Please add Claims 33 - 34. The Claim Listing below will replace all prior versions of the claims in the application.

Claim Listing

1-12 (Cancelled)

13. (Currently Amended) A proton-conducting electrolyte membrane obtained by a method comprising the steps:

- a) expanding a polymer film with a liquid that contains a vinyl-containing phosphonic acid, and
- b) polymerizing the vinyl-containing phosphonic acid present in the liquid of step a), ~~characterized in that~~ thereby forming an interpenetrating network of polyvinyl-containing phosphonic acid and the polymer,
wherein

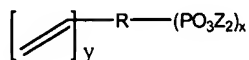
the product obtained in step (b) includes between 10% and 99.5% by weight of polyvinyl-containing phosphonic acid; and

the intrinsic conductivity of the inventive membrane at temperatures of 160°C is at least 0.001 S/cm.

14. (Currently Amended) The membrane of Claim 13, characterized in that the film used in step a) has an expansion of at least ~~[[3%]]~~ 10% in the liquid containing vinyl-containing phosphonic acid.

15. (Previously presented) The membrane of Claim 13, characterized in that the polymers used in step a) are high-temperature stable polymers which contain at least one nitrogen, oxygen, or sulphur atom in one or more recurring units.

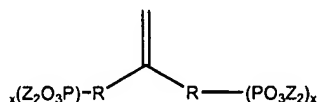
16. (Previously presented) The membrane of Claim 13, characterized in that the liquid containing the vinyl-containing phosphonic acid contains compounds of the formula



in which

- R denotes a bond, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂ and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10
- y denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10

or the formula

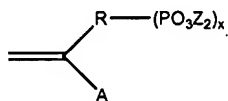


in which

- R denotes a bond, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, C5-C20 aryl or heteroaryl group, and the abovementioned

radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂, and

x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10,
or the formula



in which

- A represents a group of formula COOR², CN, CONR²₂, OR², or R², in which R² denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, or C5-C20 aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- R denotes a bond, a bivalent C1-C15 alkylene group, bivalent C1-C15 alkyleneoxy group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂,
- Z independently of each other denotes hydrogen, a C1-C15 alkyl group, C1-C15 alkoxy group, ethyleneoxy group, or C5-C20-aryl or heteroaryl group, and the abovementioned radicals are optionally substituted by halogen, -OH, COOZ, -CN, NZ₂, and
- x denotes a whole number 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10.

17. (Cancelled)

18. (Previously presented) The membrane of Claim 13, characterized in that the liquid containing the vinyl-containing phosphonic acid contains at least one substance that is capable of radical formation.

19. (Previously presented) The membrane of Claim 13, characterized in that the polymerization of step c) takes place by irradiation with IR light, NIR light, UV light, β -radiation, γ -radiation, or electron radiation.
20. (Previously presented) The membrane of Claim 13, characterized in that the membrane has an intrinsic conductivity of at least 0.001 S/cm.
21. (Currently amended) The membrane of Claim 13, characterized in that the membrane contains between 0.5% and ~~[[97]]~~ 95% by weight of polymer and between ~~99.5 and 3%~~ 10% and 99.5% by weight ~~polyvinylphosphonic~~ polyvinyl-containing phosphonic acid.
22. (Previously presented) The membrane of Claim 13, characterized in that the membrane has a layer containing a catalytically active component.
- 23-32. (Cancelled)
33. (New) The proton-conducting electrolyte membrane of Claim 13, wherein the product obtained in step (a) includes at least 50% by weight of vinyl-containing phosphonic acid.
34. (New) The proton-conducting electrolyte membrane of Claim 13, wherein the product obtained in step (a) includes at least 70% by weight of vinyl-containing phosphonic acid.